

A new species of *Angulitermes* from North India (Isoptera: Termitidae: Termitinae)

BY

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(With three plates)

***Angulitermes akhorisainensis* sp. nov.**

MATERIAL

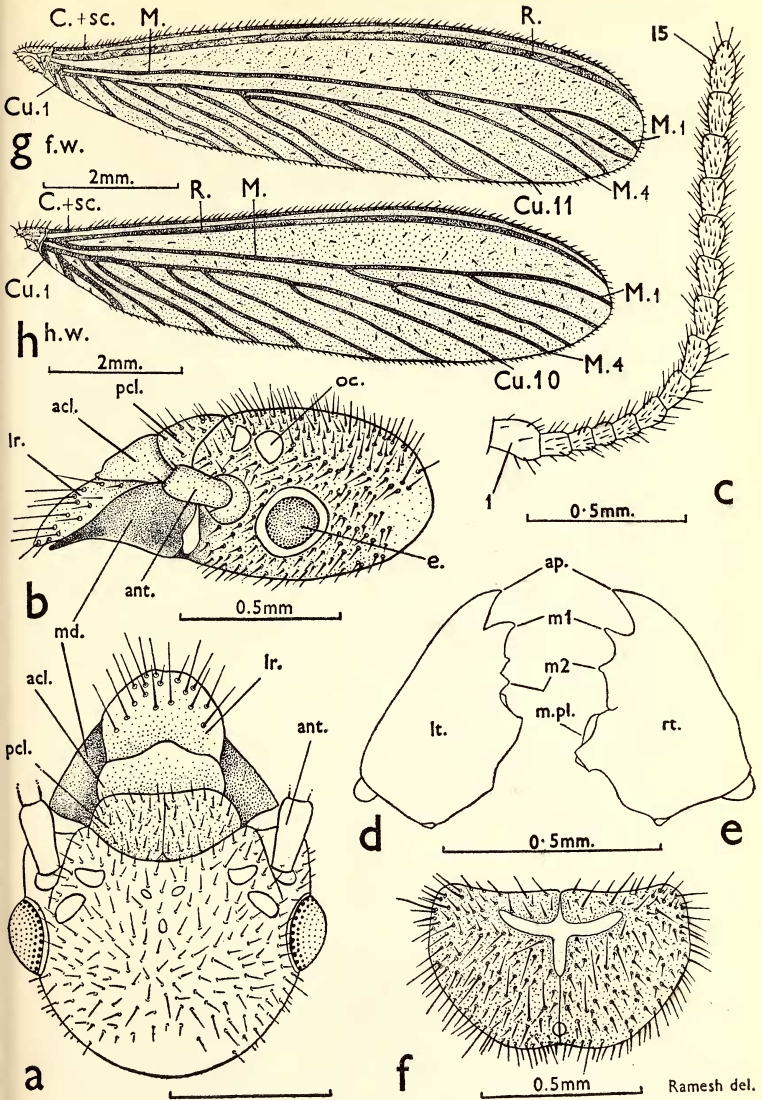
One spirit vial (No. 17) containing 16 imagines, 5 soldiers, and 4 workers collected from Akhorisain block (7000 feet above sea-level), Tehri Range, Tehri Garhwal Forest Division, U.P., by Avinash Chandra, on 5 June 1962 under stone.

DESCRIPTION

1. IMAGO (Plate I)

General. Head-capsule chocolate colour with greenish tinge; postclypeus light castaneous brown; labrum pale brown; antennae infuscated, paler distally; pronotum slightly paler than head-capsule, with a pale yellow transverse mark a little below the anterior margin. Abdomen with tergal segments uniformly coloured, with light yellow intertergal portions; sterna light castaneous brown; legs tinged with yellow brown colour. Head and body densely pilose. Total body-length with wings c. 11.00-11.50 mm.; without wings c. 6.00-6.90 mm.

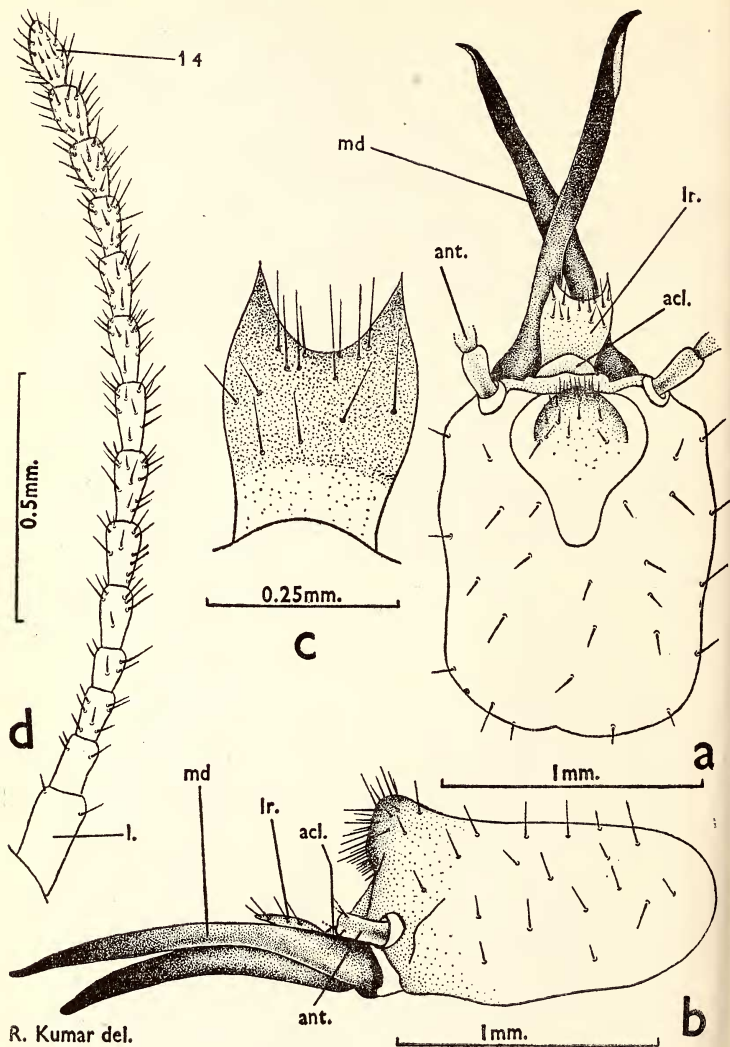
Head. Head-capsule sub-oval, wider than long (up to lateral base of mandibles); maximum length 0.75-0.85 mm.; maximum width 0.90-0.95 mm.; widest across the eyes; posterior margin round. *Epicranial-suture*: Absent. *Fontanelle*: Small, longitudinal, slit-like, situated at the base of apical third of head-capsule. *Antennae*: 15-segmented; 1st segment largest; 2nd cylindrical, longer than 3rd; 3rd longer than 4th; 5th onward progressively increasing in length, last cone-shaped. *Eyes*: Large, black, sub-circular; separated from the lower margin of head by half their short diameter (without ocular sclerites). *Ocelli*: Oval,



Angulitermes akhorisainensis sp. nov., caste: Imago

(a) head, dorsal view; (b) head, side view; (c) right antenna; (d) left mandible; (e) right mandible; (f) pronotum, dorsal view; (g) left forewing; (h) hindwing
acl., anteclypeus; *ant.*, antenna; *ap.*, apical teeth; *C.+sc.*, fused costa and subcosta; *Cu.1-Cu.11.*, 1st to 11th cubital branches; *e.*, eye; *f.w.* forewing; *h.w.* hindwing; *l.r.*, labrum; *lt.*, left; *m1-m2.*, 1st and 2nd marginal teeth; *md.*, mandible; *M.*, median; *M.1-M.4.*, 1st-4th median branches; *m. pl.*, molar plate; *oc.*, ocellus; *pcl.*, postclypeus; *R.*, radius; *rt.*, right

Ramesh del.



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Angulitermes akhorisainensis sp. nov., caste : Soldier

(a) head, dorsal view ; (b) head, side view ; (c) labrum ; (d) right antenna
acl., anteclypeus ; ant., antenna ; lr., labrum ; md., mandible

translucent, separated from the eyes by their short diameter. *Labrum*: Large, wider than long; widest near the middle; anterior margin narrowed and rounded; pilose. *Clypeus*: Postclypeus large, swollen, somewhat kidney-shaped, posterior margin convex, anterior margin concave; length about half its width; divided by a wide longitudinal median line; densely pilose. Anteclypeus trapezoid, prominent. *Mandibles*: Straw-coloured, with dark brown inner toothed margins. Left mandible with one apical, two marginals, and a blunt projection; apical large, finger-like, slightly incurved near the tip; 1st marginal large with posterior margin strongly sinuate, ending in a pseudo-tooth; 2nd marginal small. Right mandible with one apical, two marginals and a molar plate; apical tooth similar to that of left mandible; 1st and 2nd marginals sub-equal; molar plate prominent, upper margin concave.

Thorax. *Pronotum*: Flat, inner margin slightly elevated, concave, weakly notched medially; posterior margin distinctly emarginate; densely hairy. *Legs*: Long, slender and thickly pilose; tibial spurs 3: 2: 2; tarsi 4-segmented.

Wings. Dark grey; densely covered with fine granules; margins beset with numerous short hairs, surface with scattered short hairs. *Forewing*: Costa and subcosta fused, running parallel and close to prominent radius; median arising independently midway between the radius and cubitus outside the wing scale, bifurcating near the posterior third of wing, both inner and outer branches either simple or with 1-4 and 1-5 branches respectively; cubitus variable, with 7-11 branches. *Hindwing*: Costa, subcosta, and radius as in forewing; median arising from the radius well behind the wing scale, otherwise similar to that of forewing; cubitus also as in forewing. The wings of both sides of the same individual frequently differ.

Abdomen. Elongate, hairy; cerci short, 2-segmented and hairy.

2. SOLDIER (Plate II)

General. Head-capsule pale yellow to straw yellow; antennae and labrum slightly paler than head-capsule; mandibles dark reddish brown; body whitish yellow. Head sparsely, body moderately pilose. Approximate total body-length 4.10-4.60 mm.

Head. Head-capsule rectangular dorsally, longer than wide; widest near the anterior angles; sides sinuate; posterior margin broadly rounded. Frontal projection prominent, bluntly rounded, somewhat cone shape from above; in profile, dorsal surface somewhat sinuate, anterior border straight; densely pilose. *Fontanelle*: Lying below the frontal projection, prominent, and hairy. *Eyes* and *Ocelli*: Absent. *Antennae*: Arising from the dorsum of head-capsule; 14-segmented,

long and filiform; pilose, pilosity increasing towards the distal segments; 1st largest; 2nd and 3rd sub-equal; 4th shortest; 5th to 8th progressively increasing, 9th to 14th gradually decreasing in length. *Clypeus* :

TABLE I
BODY-MEASUREMENTS (IN MM.) OF *Angulitermes akhorisainensis* sp. nov.,
CASTE : IMAGO (six specimens measured)

Body-parts	Range	Mean
I. GENERAL		
1. Total body-length with wings ..	11.00-11.50	11.22
2. Total body-length without wings ..	6.00- 6.90	6.30
II. HEAD		
3. Length of head to lateral base of mandibles ..	0.70- 0.85	0.78
4. Maximum width of head with eyes ..	0.90- 0.95	0.92
5. Maximum height of head ..	0.45- 0.55	0.48
6. Length of labrum ..	0.25- 0.30	0.28
7. Width of labrum ..	0.35- 0.40	0.39
8. Long diameter of eye without sclerites ..	0.18- 0.20	0.19
9. Short diameter of eye without sclerites ..	0.15- 0.18	0.16
10. Length of ocellus ..	0.10- 0.12	0.10
11. Width of ocellus ..	0.08- 0.09	0.08
12. Eye-ocellus distance (without ocular sclerites) ..	0.08- 0.09	0.08
III. THORAX		
13. Length of pronotum ..	0.48- 0.55	0.51
14. Width of pronotum ..	0.75- 0.80	0.78

Postclypeus yellow, short and slightly swollen. Anteclypeus white, longer than postclypeus. *Labrum* : Subquadrate, sides converging posteriorly; widest anteriorly; anterior margin deeply concave with antero-lateral horns. *Mandibles* : Long, slender, of snapping type; bow-shaped in side view, slightly longer than head-capsule, outer margin sinuate, conspicuously hooked apically. *Postmentum* : Club-shaped, pilose; widest near the base of apical third; sides parallel up to basal two-third, then converging anteriorly; anterior margin truncate; posterior margin subconcave,

Thorax. *Pronotum* : Strongly saddle-shaped ; anterior lobe considerably raised ; anterior margin weakly convex, posterior margin somewhat

TABLE II
BODY-MEASUREMENTS (IN MM.) OF *Angulitermes akhorisainensis* sp. nov.,
CASTE : SOLDIER (five specimens measured)

Body-parts	Range	Mean
I. GENERAL		
1. Total body-length ..	4.10-4.60	4.38
II. HEAD		
2. Head-length to base of mandibles ..	1.35-1.40	1.37
3. Head-length to tip of fontanelle ..	1.30-1.35	1.32
4. Maximum width of head ..	1.00-1.05	1.01
5. Maximum height of head (excluding postmentum but including frontal projection) ..	0.75-0.85	0.80
6. Head-index I (Width/length) ..	0.72-0.75	0.74
7. Head-index II (Height/width) ..	0.75-0.85	0.79
8. Head-index III (Height/length) ..	0.56-0.63	0.59
9. Fontanelle index (Head-length to fontanelle/Head-length to base of mandibles) ..	0.94-0.96	0.95
10. Length of labrum (excluding lateral horns) ..	0.18-0.23	0.20
11. Maximum width of labrum ..	0.25-0.30	0.28
12. Length of mandibles		
(a) Right mandible ..	1.35-1.45	1.40
(b) Left mandible ..	1.35-1.45	1.40
13. Head-mandibular index (Left mandible length/Head-length to mandibular base) ..	1.00-1.04	1.02
14. Min. median length of postmentum ..	0.45-0.48	0.46
15. Maximum width of postmentum ..	0.28-0.33	0.30
16. Minimum width of postmentum ..	0.18-0.20	0.19
III. THORAX		
17. Length of pronotum ..	0.20-0.25	0.22
18. Maximum width of pronotum ..	0.45-0.55	0.50

straight ; weakly notched medially both anteriorly and posteriorly ; pilose. *Legs* : Relatively long, slender, and pilose ; tibial spurs 3 : 2 : 2 ; tarsi 4-segmented.

Abdomen. Short, hairy.

3. WORKER (Plate III)

General. Head-capsule pale yellow to straw yellow, with central whitish glandular portion; mandibles straw-coloured with dark brown toothed margin; postclypeus of same colour as head-capsule; labrum, antennae, and legs paler than head-capsule. Head moderately and body densely hairy. Approximate total body-length 4.00-4.50 mm.

Head. Head-capsule suboval, wider than long (up to lateral base of mandibles); posterior margin round. *Epicranial-suture*, *Eyes* and *Ocelli*: Absent. *Fontanelle*: Not visible. *Antennae*: 14-segmented; 1st largest; 2nd longer than 3rd; 3rd somewhat subequal to 4th; 5th onward progressively increasing in length; last cone-shaped. *Clypeus* and *Labrum*: As in imago. *Mandibles*: of *Angulitermes* type.

Thorax. *Pronotum*: Strongly saddle-shaped; anterior lobe considerably raised; anterior and posterior margins convex and without any emargination. *Legs*: Short (relatively to body) slender and pilose; tibial spurs 3:2:2; tarsi 4-segmented, hairy.

Abdomen. Oblong, transparent, hairy; cerci 2-segmented and hairy.

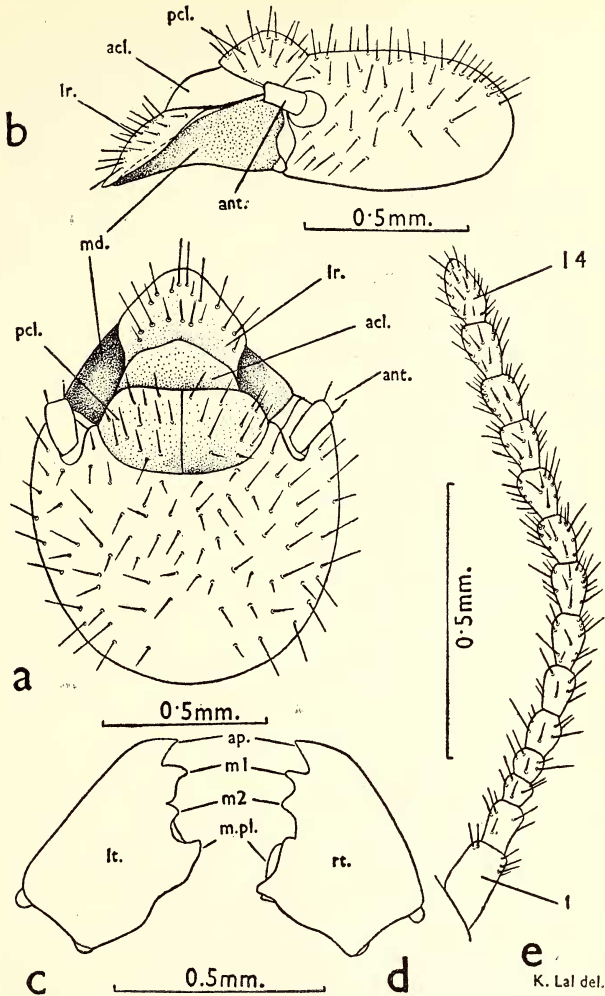
TABLE III
BODY-MEASUREMENTS (IN MM.) OF *Angulitermes akhorisainensis* sp. nov.,
CASTE: WORKER (four specimens measured)

Body-parts	Range	Mean
I. GENERAL		
1. Total body-length ..	4.00-4.50	4.30
II. HEAD		
2. Head-length to base of mandibles ..	0.70-0.80	0.74
3. Maximum width of head ..	0.80-0.90	0.86
4. Length of postclypeus ..	0.25-0.30	0.28
5. Maximum width of postclypeus ..	0.45-0.50	0.48
III. THORAX		
6. Length of pronotum ..	0.20-0.25	0.22
7. Width of pronotum ..	0.50-0.55	0.52

TYPE SPECIMENS

All the specimens from a single source as under heading 'Material' are deposited as follows:

(i) *Holotype* and *Morphotype*. One holotype soldier and a morphotype imago and worker (M. C. No. $\frac{20324}{1}$) in a vial, from



K. Lal del.

Angulitermes akhorisainensis sp. nov., caste: Worker

(a) head, dorsal view ; (b) head, side view ; (c) left mandible ; (d) right mandible ; (e) right antenna

acl., anteclypeus ; ant., antenna ; ap., apical tooth ; lr., labrum ; lt., left ; m1-m2., 1st and 2nd marginal teeth ; m.pl., molar plate ; pcl., postclypeus ; rt., right

Akhorisain block (7000 feet above sea-level), Tehri Range, Tehri Garhwal Forest Division, U.P., coll. Avinash Chandra, on 5 June 1962, deposited in Entomological Collection, Forest Research Institute, Dehra Dun (U.P., India).

(ii) *Paratypes* and *Paramorphotypes*. The paratype soldiers, paramorphotype imagos and workers from the holotype lot are deposited as follows: (1) One soldier, two imagines, and one worker, (M. C. No. $\frac{20324}{2}$) in separate vials in (a) National Zoological Collection, Zoological Survey of India, Calcutta, (b) Prof. Emerson Collection, Chicago University, Chicago (U.S.A.). (2) Rest of the paratype soldiers, paramorphotype imagos and workers deposited in Entomological Collection, Forest Research Institute, Dehra Dun (U.P. India).

TYPE LOCALITY

India: Uttar Pradesh: Akhorisain block (7000 feet above sea-level), Tehri Range, Tehri Garhwal Forest Division.

GEOGRAPHICAL DISTRIBUTION

Known only from the type locality.

COMPARISON

This new species is close to *Angulitermes dehraensis* (Gardner) and *A. acutus* Mathur & Sen-Sarma, but can be separated as follows:

From *A. dehraensis* (Cotype examined and compared):

Imago: (i) Larger in size, (ii) Chocolate colour with greenish tinge (v. dark brown in *dehraensis*), (iii) Ocelli farther from eyes, eye-ocellus distance equal to its short diameter (v. less than its short diameter in *dehraensis*), (iv) Eyes separated from the lower margin of the head by half their short diameter (v. less than half diameter in *dehraensis*), (v) Median dividing line of postclypeus more prominent and wide (v. fine and less prominent in *dehraensis*), (vi) Median vein always bifurcated (v. not always bifurcated in *dehraensis*), (vii) Cubitus with lesser number of veins (7-11) v. 10-14 in *dehraensis*.

Soldier: (i) Frontal projection upright, somewhat conical from above, and with straight anterior border in side view (v. protruded forward and with a small notch in the lower half in *dehraensis*), (ii) Labrum with more convergent sides posteriorly (less convergent in *dehraensis*), (iii) Postmentum comparatively wider than in *dehraensis*.

From *A. acutus* (Paratype examined and compared):

Soldiers: (i) Large species, (ii) Frontal projection less prominent and without any pointed tip (v. prominent and with a pointed tip in *acutus*), (iii) The front margin of labrum more deeply concave (v. broadly concave in *acutus*), (iv) Tibial spurs 3:2:2 (v. 2:2:2 in *acutus*).